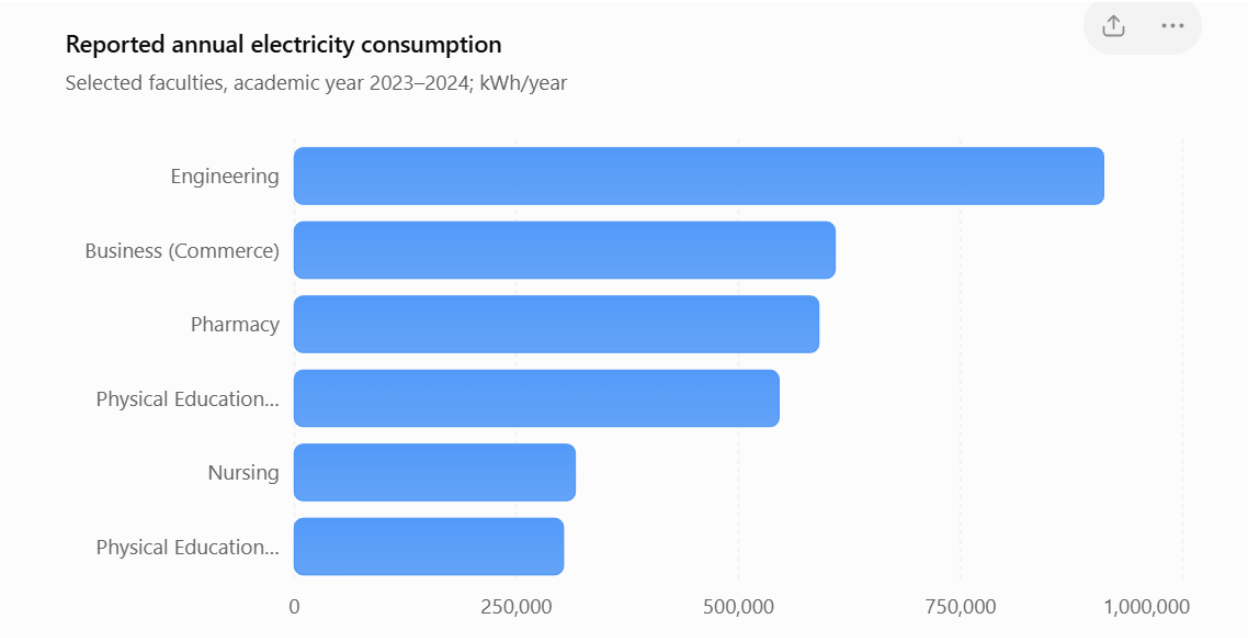
7.2.5 Alexandria University energy reviews to identify areas where energy wastage is highest

Alexandria University uses systematic energy reviews to evaluate building performance and monitor energy consumption across its faculties and institutes. Through expert energy audits, assessment tools, and data analysis, the institution identifies energy waste, improves energy efficiency, and ensures compliance with environmental regulations. These reviews reduce carbon emissions, support sustainable development, and strengthen institutional leadership aligned with Egypt Vision 2030, clean energy policies, and global climate goals.

Alexandria University undertakes institutional energy reviews to assess energy consumption, identify inefficient facilities and equipment, and support the implementation of energy conservation measures across its faculties, institutes, and administrative buildings.

The University maintains electricity consumption records at faculty and institute levels, enabling comparative assessment of energy demand and identification of facilities requiring further technical investigation. Its energy management activities include building energy monitoring, assessment of lighting and cooling efficiency, thermal insulation evaluation, electrical load analysis, and examination of equipment performance. The University's Energy Conservation Advisory Group, based at the Institute of Graduate Studies and Research, provides specialized technical expertise in energy assessment, combustion efficiency, electrical systems, and environmental measurements.

In January 2025, the University's Community Service and Environmental Development Council discussed establishing a university-wide committee to coordinate electricity conservation across faculties and institutes. These activities provide an institutional framework for identifying potential energy wastage, prioritizing energy-efficiency improvements, and monitoring progress toward reducing overall energy consumption.



Alexandria University has made significant academic and operational progress in sustainability over recent years, aligning institutional practices with Egypt Vision 2030 and sustainable development goals. The university's comprehensive waste management framework features formal policy, defined responsibilities, and quantifiable targets monitored through annual reporting to improve energy efficiency, reduce carbon emissions, and optimize resources.

- Alexandria University leads community service and environmental protection across regional governorates while supporting sustainable development. The university and its faculties remain committed to national environmental regulations and policy frameworks. Through accredited environmental impact assessment studies, environmental records, and digital monitoring, consultants evaluate project performance to optimize resource utilization, manage waste, reduce carbon emissions, and ensure compliance with safety standards across all academic buildings, facilities, and campus operations.
- The university integrates administrative principles into governance structures, capacity building programs, awareness initiatives, and institutional oversight mechanisms. Control measures are periodically reviewed to reinforce internal performance, reduce institutional risks, and ensure compliance with national regulations and standards.
- Program effectiveness, system performance, and energy efficiency are continuously evaluated through data analytics, operational indicators, storage rates, performance surveys, and stakeholder feedback. Evaluation outcomes are used to revise control models, introduce emerging technology solutions, and strengthen energy conversion readiness. Alexandria University's power management and control system functions as a comprehensive governance mechanism that supports optimal behavior, protects resources, improves operational performance, strengthens public trust, and contributes to sustainable energy development.
- Renewable energy transformation forms a central pillar of Alexandria University's sustainability agenda. Since 2017, the university has implemented energy conservation and digitalization programs aimed at reducing power consumption and improving battery efficiency.



- Major institutional mechanism supporting this vision is the Alex University Sustainability Office, which coordinates sustainability planning and implementation across the university. The office promotes sustainability culture, improves energy efficiency, develops environmental policies, monitors environmental performance, supports innovation in renewable energy and clean technologies, strengthens partnerships, and advances green economy principles. Sustainability governance is reinforced through subsidiary offices and faculty coordinators to ensure institution-wide implementation and monitoring.
- Alexandria University has consistently published its sustainability report on its official website for four consecutive years, covering the 2022, 2023, 2024, and 2025 reporting periods. Each report provides a

comprehensive overview of the university's sustainability achievements, including environmental performance, green campus infrastructure, academic and research initiatives aligned with sustainable development goals, and community engagement activities that support Egypt Vision 2030. The reports also highlight formal institutional policies and governance frameworks for integrating sustainability across education, research, operations, and outreach. These policies remain publicly accessible and systematically embedded within strategic planning and operational practices. Continuous annual publication reflects strong commitment to transparency, accountability, and sustainable development.

- Green-building measures are implemented across the campus. LED lighting with occupancy/daylight controls is installed; BMS-based scheduling and monitoring-based commissioning with sub-metering are applied; VFDs are fitted on major fans and pumps and AHU motors are upgraded; exterior lighting curfews with photocells are applied; rooftop/carport solar PV is deployed; heat-island reduction is addressed with cool roofs, shade trees, light/permeable paving, and PV canopies; rainwater harvesting and AC-condensate recovery are used for irrigation and flushing; smart irrigation and drip systems with drought-tolerant planting are in place; water-efficient fittings, leak detection, and water sub-metering are implemented; low-emitting, EPD/recycled-content materials are specified under a sustainable purchasing policy, and sustainably sourced timber is required; waste segregation for paper/card, plastics/metals, glass, e-waste, and organics is provided; ventilation and IAQ controls (CO_2 monitoring, filtration, ETS control, IAQ testing) are implemented; daylighting and glare control and acoustic comfort measures are provided; integrated pest and landscape management with erosion control is practiced; refrigerants with zero ODP and low GWP are specified with leak detection and recovery; safety programs and Building User Manuals are maintained; monthly KPIs (BEI, kWh saved, IAQ, faults closed) are reported; and innovation pilots (analytics/FDD, circular labs, low-carbon materials) are underway, while heat-recovery solutions for hot water/reheat are planned.
- Driven by the University's keen commitment to transforming into an environmentally friendly institution dedicated to enhancing resource management and rationalizing energy consumption, the Department of Community Service Development launched a comprehensive project aimed at the total transformation of all used fluorescent lighting by replacing them with modern LED bulbs. These light-emitting diodes provide significantly higher efficiency, lower energy consumption, and extended operational lifespans compared to conventional fluorescent lamps. Initiated in 2019, the project has been systematically implemented in structured phases, beginning with a complete inventory of the total quantities required across all university faculties and institutes. During the first quarter, 30% of the necessary stock—covering specific 60 cm, 120 cm, and 9-watt bulb categories—was procured and installed. Concurrently, appropriate measures were executed to safely discard the decommissioned fluorescent lamps through specialized environmental disposal contractors. The second stage involved purchasing and transitioning 37% of the total university requirements, while the third stage accounted for another 25%. In the final phase, the complete transformation of all remaining LED units was successfully performed. The table below summarizes the total quantity of LED bulbs required for this total transition to a green energy source, detailing the replacement percentages achieved over the past four years.




LED Lighting



Green building implementation through the use of sun breakers in the SSP building at the Faculty of Engineering

- The university has achieved 55.6% implementation of smart building technologies through progressive integration of digital infrastructure and intelligent management systems across campus facilities. Key applications include digital smart attendance systems, automated monitoring and reporting platforms, fire alarm and smoke detection systems, video surveillance, and digital access and safety controls. Training programs have also been conducted to support effective system adoption and operation. These initiatives contribute to improved operational efficiency, enhanced safety and security, reduced manual processes, and advancement of a connected, data-driven environment.
- The university also monitors greenhouse gases and solid particles to prevent environmental pollution and mitigate climate change. Monitoring is conducted by faculty members holding consultant certificates for self-monitoring of facilities, alongside environmental measurements performed in accredited laboratories.

- **Energy Conservation Advisory Group in Center for Graduate Studies and Research – Institute of Graduate Studies and Research – Alexandria University**

This group is concerned with reviewing energy in all its forms at all levels, such as measuring and analyzing exhaust gases in furnaces and boilers with the aim of improving combustion efficiency and reducing emissions, measuring and analyzing boiler water, in addition to tests of thermal insulation efficiency, lighting efficiency, electrical energy analysis, and compatibility with electrical loads. It also determines the power factor to increase efficiency. Rationalizing the energy used, reviewing energy use, radiation measurements and safety tests for radioactive sources. The group has a mobile laboratory that can visit sites and make environmental measurements related to energy as well as emissions and study energy consumption and the extent of thermal insulation in industrial sites.